Part 121—Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft

This change incorporates Amendment 121–246, Traffic Alert and Collision Avoidance System, TCAS I, adopted December 23, 1994. This final rule revises § 121.356(b).

Bold brackets appear around the revised material.

Page Control Chart

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Suggest filing this transmittal at the beginning of the FAR. It will provide a method for determining that all changes have been received as listed in the current edition of AC 00–44, Status of Federal Aviation Regulations, and a check for determining if the FAR contains the proper pages.

avoidance system (TCAS I). This amendment is necessary due to delays in TCAS I equipment development and testing, the complexity of equipment use and installation, and the requirement to complete complex supplemental type certification programs.

DATES: This document is effective December 29, 1994. The final compliance date is December 31, 1995. Comments on the revision of section 121.356(b) must be received on or before February 27, 1995.

ADDRESSES: Send or deliver comments on the revision of section 121.356(b) in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attn: Rules Docket (AGC–204), Room 916, 800 Independence Avenue, SW., Washington, DC 20591. Comments may be examined in the Rules Docket weekdays, except Federal Holidays, between 8:30 a.m. and 5:00 p.m.

FOR FURTHER INFORMATION CONTACT: Gary E. Davis, Project Development Branch (AFS–240), Air Transportation Division, Office of Flight Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267–8096.

SUPPLEMENTARY INFORMATION:

Background

In a petition for exemption dated October 13, 1992, the Regional Airline Association (RAA) petitioned on behalf of its affected member airlines and other similarly situated airlines for a temporary exemption from the February 9, 1995, deadline to install an approved TCAS I system (Docket No. 27008). The exemption was requested for operators of turbine-powered airplanes with 10 to 30 passenger seats. The FAA denied the petition on May 27, 1993. The FAA stated in its denial that the general relief requested by the RAA is more appropriately handled by rulemaking rather than exemption. This action is the subsequent rulemaking response to the RAA petition for exemption. The RAA's petition also sought a temporary exemption from the April 20, 1994, deadline to install an approved Ground Proximity Warning System (GPWS), which the FAA has denied and is not an issue in this rulemaking.

In its October 13 petition, the RAA stated that extension of the compliance date was needed because of delays in the development and operational testing of prototype TCAS I equipment. The RAA stated that when Amendment No. 135–30 established the TCAS I requirements on January 6, 1989, the FAA acknowledged that no TCAS I design had been approved, and no manufacturer had built a TCAS I unit. The FAA considered these points in establishing a compliance date for installation and operation of TCAS I at 6 years from the effective date of the amendment.

RAA further stated that it was informed early in 1990 by ARINC Research Corporation (ARINC), the FAA's TCAS I program contractor, that equipment would be available for a Limited Installation Program (LIP) testing by April 1991, and that the test would be completed in approximately 1 year. RAA stated that ARINC advised it that the development program for prototype TCAS I equipment was still not complete, and that the LIP for the operational evaluation was not expected to begin for at least several months.

RAA stated in its petition that because of this the TCAS I development and operational evaluation program was more than 18 months behind its original planned schedule, no TCAS I equipment had yet received a technical standards order (TSO) approval, and to the RAA's knowledge, only one manufacturer was currently accepting orders for TCAS I deliveries. Air carriers are naturally reluctant to place orders for this equipment before a TSO is issued and before the LIP has confirmed the validity of the equipment design.

RAA asserted that an extension of time was required to permit the evaluation and procurement of TCAS I equipment, to develop and obtain approval of supplemental type certificates (STC) for each

similar extension and phased installation schedule for TCAS I installations. In fact, the TCAS I LIP was just completed in June, 1994, and there remained, at the time of their petition, a lack of any approved equipment installations because of the lengthy STC approval process. Thus, the RAA expected that operators would not be able to complete equipment selections and installations on all airplanes by February 9, 1995.

RAA's petition for exemption also stated that FAA should rejustify the need for a TCAS I rule. The RAA based its rationale on the fact that the rule has a significantly higher-than-estimated cost to the airline industry. RAA and its member carriers continue to support realistic and achievable improvements in safety where the benefits clearly justify the costs. It believes that the cost of safety-related equipment must be compared to the potential benefits and the capability of the industry to afford it; therefore, the FAA should consider alternative approaches.

Aircraft seating 10 to 30 passengers and operating under part 121, 129, or 135 must be equipped with TCAS I by February 9, 1995, in accordance with the regulation issued January 5, 1989 (54 FR 940). RAA believed that the FAA should consider implementing a phased compliance schedule as was done for part 121 carriers that were required to install TCAS II (14 CFR 121.356), rather than adhere to the deadlines in affected regulations.

The air carriers represented by RAA believe that extending the compliance schedule for TCAS I would not adversely affect safety because it would allow affected airlines to devote limited economic resources to the orderly completion of TCAS I installations, along with other air-worthiness and safety-related requirements. They believe the general public will benefit by allowing for a more efficient allocation of an operator's resources, and by reducing the number of disruptions of scheduled service due to excessive unscheduled removal of aircraft from service for equipment installation.

Consideration of Comments

The FAA published a notice of proposed rulemaking, in the *Federal Register* on March 31, 1994, (59 FR 15308), proposing an extension of the compliance date to March 31, 1997, to require that all affected aircraft be equipped with TCAS I and seeking comments on the use of a phased compliance schedule similar to the schedule that currently exists for TCAS II. The FAA also invited public comment on any issue discussed in the notice, and fully considered each commenter's position before making any final decision on extending the TCAS I compliance date.

Ten comments were received from individual operators, aircraft leasing companies, equipment manufacturers, and trade associations. Eight support the petition; two oppose it in its entirety, generally citing TCAS as cost prohibitive. Of the eight supporting the petition, five recommended that there be no phase in of the compliance schedule; three recommended some form of a phase in.

Equipment manufacturers that commented on this rule favored a phased compliance schedule because it would spread sales over a 2 year period. This would provide an orderly manufacturing process, thereby reducing product shortages as the final compliance date nears. Commenters that were not in favor of a phased compliance schedule felt that an arbitrary schedule sometimes places an undue burden on operators to remove equipment from revenue service early in order to meet the arbitrary date, when in fact, final installation may be scheduled a few months later during the normal maintenance cycle.

The FAA does not agree with commenters who want to rescind the rule. Analysis and experience indicate that the safety benefits from this rule more than justify its costs. In addition, the FAA considers those comments to be beyond the scope of the proposal.

Discussion of the Amendment

The FAA has considered all the facts and circumstances presented by the RAA and commenters and extends the compliance date until December 31, 1995, for the installation of TCAS I in parts 121, 129, and 135.

The FAA estimates that there are at least 25 different makes and models of airplanes that operate under part 135 and are required to have TCAS I installed. Many of these aircraft have been designed and manufactured overseas, thus complicating the issue of availability of design data for supplemental type certification, which is required of each different make/model installation. The FAA, however, believes that the compliance date of December 31, 1995, can be met by the majority of affected air carriers. Because the basic requirement for TCAS has been part of the regulations since 1989, the FAA believes that air carriers have been making and implementing plans to install the TCAS system, i.e., identifying requirements, identifying sources of equipment, budgeting, projecting affected maintenance schedules, etc., even though the initial testing phase of the equipment was behind schedule.

Deviation Procedures

The FAA recognizes that, in rare cases and despite the exercise of best efforts, there may be justification for some additional extension to the mandated compliance date. Accordingly, the FAA has provided a means to request and receive a deviation of up to 6 months from the carrier's local Principal Avionics Inspector (PAI) with the concurrence of the Director, Flight Standards Service (AFS–1). Air carriers must plan appropriate petition lead times to gain these approvals, with a minimum of 60 days required from receipt of request to final approval. Deviations will only be granted in extraordinary and unforeseen circumstances, beyond the control of the air carrier. Even in such circumstances, a deviation will not be granted unless specific criteria are met: The carrier must show that a good faith effort has been expended to meet the compliance date of December 31, 1995. In addition, the carrier must document that it cannot meet certain milestones such as TCAS equipment delivery, STC approval, installation schedules, and that the aircraft could not be removed from service without a significant adverse impact on the flying public.

Based on the above factors, and those discussed elsewhere in this document and in the Notice, the FAA is extending the compliance date to December 31, 1995. The FAA finds that this extension is in the public interest, in that it represents an appropriate balance between enhancement of safety and reasonable feasibility of compliance. Since parts 121 and 129 contain a similar rule for operators of aircraft with 30 seats or less, the FAA is extending the compliance date for those operators as well. However, the FAA does not find it appropriate to grant as much relief as originally proposed because, as recognized by the FAA, the TCAS system is an important piece of equipment, which provides a significant enhancement of the safety of air travel. Therefore, the compliance schedule has been adjusted from the original Notice.

Because TCAS is an important part of the overall safety system, the FAA wants certificate holders to comply with this TCAS rule as soon as possible. In an effort to facilitate this, the FAA will advise the traveling public of air carriers that have complied with this rule significantly earlier than the required compliance date.

The TCAS rule, which was originally adopted in 1989, envisioned covering all aircraft with 10 or more passenger seats. The preamble to the original rule indicated the FAA's intent to require TCAS I for the 10 to 30 passenger seat aircraft, which are primarily operated under part 135. However, the notice inadvertently did not propose a similar provision for these aircraft for part 121, to cover those infrequent circumstances in which these aircraft are operated under that part. The original final rule, however, did insert a provision in part 121 covering combination cargo/passenger airplanes with 10–30 passenger seats. This final rule will revise that part 121 TCAS I provision in section 121.356(b) to cover all 10–30 passenger-seat airplanes. The FAA views this change as posing no additional burden to the industry because these aircraft are usually operated under part 135. Carriers who operate both these aircraft and larger aircraft sometimes seek FAA authorization to operate all aircraft under part 121 to simplify functions such as crewmember training. These operators do not seek to follow part 121 rules to avoid the installation of TCAS.

The FAA considers further comment on this provision to be unnecessary, and is adopting this revision in this final rule. However, in accordance with DOT policy, interested persons are invited to submit

Transportation policies and procedures, the FAA has estimated the anticipated benefits and costs of this rulemaking action. The FAA has determined that this rule is not a "significant rulemaking action," as defined by Executive Order 12866 (Regulatory Planning and Review).

The rule will extend the compliance date to install an approved traffic alert and collision avoidance systems (TCAS I) from February 9, 1995, to December 31, 1995. This rule will apply to turbine-powered aircraft with 10 to 30 seats operated under parts 121, 135 and 129. This extension of the compliance deadline is necessary because of delays in the development and operational testing of prototype TCAS I equipment, the complexity of the equipment use and installation, and the requirement to complete complex supplemental type certification programs.

Final Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily burdened by government regulations. The RFA requires agencies to review rules that may have a "significant economic impact on a substantial number of small entities."

Under FAA Order 2100.14A, the criterion for a "substantial number" is a number that is not less than 11 and that is more than one third of the small entities subject to the rules. For operators of aircraft for hire, a small operator is one that owns, but not necessarily operates, nine or fewer aircraft. This proposal would mainly affect part 135 scheduled operators, although some unscheduled operators could be affected as well. The FAA's criterion for a "significant impact" is $116,300 or more per year for a scheduled operator and $4,600 or more for an unscheduled operator.

This rule to extend the compliance date for installing TCAS I equipment will not have any economic impact on small operators. Therefore, the FAA has determined that the final rule will not have a significant impact on a substantial number of small operators.

International Trade Impact Assessment

The Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. The impact of the rule change on international trade should be limited by the regionalized nature of the routes that are typically flown by aircraft with 10 to 30 seats. In addition, the fact that this rule will have the same economic impact on both the domestic (part 135) and foreign operators (part 129) of this size range of aircraft will limit its impact on competitive relationships between these two classes of operators. Based on this information, the FAA concludes that the rule change will have a negligible impact on international trade.

Federalism Implications

This amendment does not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this rule change does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Paperwork Reduction Act

There are no requirements for information collection associated with this rule that requires approval from the Office of Management and Budget pursuant to the Paperwork Reduction Act of 1980 (Pub. L. 96–511).

Conclusion

For the reasons discussed in the preamble, this regulation is not significant under Executive Order 12866. In addition, it is certified that this amendment does not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility

106(g) (Revised Pub. L. 97–449, January 12, 1983).

all operations under this part.

(b) Instruments and equipment required by §§ 121.305 through 121.359 must be approved and installed in accordance with the airworthiness requirements applicable to them.

(c) Each airspeed indicator must be calibrated in knots, and each airspeed limitation and item of related information in the Airplane Flight Manual and pertinent placards must be expressed in knots.

(d) Except as provided in §§ 121.627(b) and 121.628, no person may take off any airplane unless the following instruments and equipment are in operable condition—

(1) Instruments and equipment required to comply with airworthiness requirements under which the airplane is type certificated and as required by §§ 121.213 through 121.283 and 121.289.

(2) Instruments and equipment specified in §§ 121.305 through 121.321 and 121.359 for all operations, and the instruments and equipment specified in §§ 121.323 through 121.351 for the kind of operation indicated, wherever these items are not already required by paragraph (d)(1) of this section.

(3) After September 1, 1976, the instruments and equipment required by § 121.360, unless required earlier—

(i) In a plan issued to the certificate holder by the Administrator to obtain information on system reliability; or

(ii) In the certificate holder's operations specifications.

(Amdt. 121–44, Eff. 9/25/68); (Amdt. 121–65, Eff. 8/11/70); (Amdt. 121–114, Eff. 1/23/75); (Amdt. 121–126, Eff. 11/24/75); (Amdt. 121–122, Eff. 6/20/91)

(b) A sensitive altimeter.

(c) A sweep-second hand clock (or approved equivalent).

(d) A free-air temperature indicator.

(e) A gyroscopic bank and pitch indicator (artificial horizon).

(f) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required when a third attitude instrument system usable through flight attitudes of 360° of pitch and roll is installed in accordance with paragraph (j) of this section.

(g) A gyroscopic direction indicator (directional gyro or equivalent).

(h) A magnetic compass.

(i) A vertical speed indicator (rate-of-climb indicator).

(j) [On large turbojet powered airplanes, and after October 17, 1994, on large turboprop powered airplanes, in addition to two gyroscopic bank-and-pitch indicators [artificial horizons] for use at the pilot stations, a third such instrument that—]

(1) Is powered from a source independent of the electrical generating system;

(2) Continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system;

(3) Operates independently of any other attitude indicating system;

(4) Is operative without selection after total failure of the electrical generating system;

(5) Is located on the instrument panel in a position acceptable to the Administrator that will make it plainly visible to and usable by any pilot at his station; and

Unless the Administrator allows or requires different instrumentation for turbine engine powered airplanes to provide equivalent safety, no person may conduct any operation under this part without the following engine instruments—

(a) A carburetor air temperature indicator for each engine.

(b) A cylinder head temperature indicator for each air-cooled engine.

(c) A fuel pressure indicator for each engine.

(d) A fuel flowmeter or fuel mixture indicator for each engine not equipped with an automatic altitude mixture control.

(e) A means for indicating fuel quantity in each fuel tank to be used.

(f) A manifold pressure indicator for each engine.

(g) An oil pressure indicator for each engine.

(h) An oil quantity indicator for each oil tank when a transfer or separate oil reserve supply is used.

(i) An oil-in temperature indicator for each engine.

(j) A tachometer for each engine.

(k) An independent fuel pressure warning device for each engine or a master warning device for all engines with a means for isolating the individual warning circuits from the master warning device.

(l) A device for each reversible propeller, to indicate to the pilot when the propeller is in reverse pitch, that complies with the following—

(1) The device may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch, but it may not give an indication at or above the normal low pitch stop position.

(2) The source of indication must be actuated by the propeller blade angle or be directly responsive to it.

§ 121.308 Lavatory fire protection.

(a) After October 29, 1986, no person may operate a passenger-carrying transport category airplane unless each lavatory in the airplane is equipped with a smoke detector system or equivalent that provides a warning light in the cockpit or provides receptacle for towels, paper, or waste located within the lavatory. The built-in fire extinguisher must be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in the receptacle.

Docket No. 24073 (50 FR 12733) Eff. 3/29/85; (Amdt. 121–185, Eff. 4/29/85)

§ 121.309 Emergency equipment.

(a) *General.* No person may operate an airplane unless it is equipped with the emergency equipment listed in this section and in § 121.310.

(b) Each item of emergency and flotation equipment listed in this section and in §§ 121.310, 121.339, and 121.340—

(1) Must be inspected regularly in accordance with inspection periods established in the operations specifications to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes;

(2) Must be readily accessible to the crew and, with regard to equipment located in the passenger compartment, to passengers;

(3) Must be clearly identified and clearly marked to indicate its method of operation; and

(4) When carried in a compartment or container, must be carried in a compartment or container marked as to contents and the compartment or container, or the item itself, must be marked as to date of last inspection.

(c) *Hand fire extinguishers for crew, passenger, cargo, and galley compartments.* Hand fire extinguishers of an approved type must be provided for use in crew, passenger, cargo, and galley comparments in accordance with the following—

(1) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used and, for passenger compartments, must be designed to minimize the hazard of toxic gas concentrations.

(2) *Cargo compartments.* At least one hand fire extinguisher must be conveniently located for

(5) *Passenger compartments.* Hand fire extinguishers for use in passenger compartments must be conveniently located and, when two or more are required, uniformly distributed throughout each compartment. Hand fire extinguishers shall be provided in passenger compartments as follows—

(i) For airplanes having passenger seats accommodating more than 6 but fewer than 31 passengers, at least one.

(ii) For airplanes having passenger seats accommodating more than 30 but fewer than 61 passengers, at least two.

(iii) For airplanes having passenger seats accommodating more than 60 passengers, there must be at least the following number of hand fire extinguishers—

Minimum Number of Hand Fire Extinguishers	
Passenger seating accommodations:	
61 through 200	3
201 through 300	4
301 through 400	5
401 through 500	6
501 through 600	7
601 or more	8

(6) Notwithstanding the requirement for uniform distribution of hand fire extinguishers as prescribed in paragraph (c)(5) of this section, for those cases where a galley is located in a passenger compartment, at least one hand fire extinguisher must be conveniently located and easily accessible for use in the galley.

(7) At least two of the required hand fire extinguishers installed in passenger-carrying airplanes must contain Halon 1211 (bromochlorofluoromethane) or equivalent as the extinguishing agent.

(d) [*First aid and emergency medical equipment and protective gloves.*

[(1) Approved first aid kits and, on passenger flights, an emergency medical kit for treatment of injuries or medical emergencies that might

(e) *Crash ax.* Each airplane must be equipped with a crash ax.

(f) *Megaphones.* Each passenger-carrying airplane must have a portable battery-powered megaphone or megaphones readily accessible to the crewmembers assigned to direct emergency evacuation, installed as follows—

(1) One megaphone on each airplane with a seating capacity of more than 60 and less than 100 passengers, at the most rearward location in the passenger cabin where it would be readily accessible to a normal flight attendant seat. However, the Administrator may grant a deviation from the requirements of this subparagraph if he finds that a different location would be more useful for evacuation of persons during an emergency.

(2) Two megaphones in the passenger cabin on each airplane with a seating capacity of more than 99 passengers, one installed at the forward end and the other at the most rearward location where it would be readily accessible to a normal flight attendant seat.

(Amdt. 121–2, Eff. 6/7/65); (Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–48, Eff. 7/11/69); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–185, Eff. 4/29/85); (Amdt. 121–188, Eff. 8/1/86); (Amdt 121–230, Eff. 10/15/92); [(Amdt 121–242, Eff. 12/2/94)]

§ 121.310 Additional emergency equipment.

(a) *Means for emergency evacuation.* Each passenger-carrying landplane emergency exit (other than over-the-wing) that is more than 6 feet from the ground with the airplane on the ground and the landing gear extended, must have an approved means to assist the occupants in descending to the ground. The assisting means for a floor level emergency exit must meet the requirements of § 25.809(f)(1) of this chapter in effect on April 30, 1972, except that, for any airplane for which the application for the type certificate was filed after that date, it must meet the requirements under which the airplane was type certificated. An assisting means that deploys automatically must be armed

gency exit of DC–3 airplanes operated with less than 36 occupants, including crewmembers and less than five exits authorized for passenger use.

(b) *Interior emergency exit marking.* The following must be complied with for each passenger-carrying airplane—

(1) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked. The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin. The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger aisle. There must be a locating sign—

(i) Above the aisle near each over-the-wing passenger emergency exit, or at another ceiling location if it is more practical because of low headroom;

(ii) Next to each floor level passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from that sign; and

(iii) On each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible the sign may be placed at another appropriate location.

(2) Each passenger emergency exit marking and each locating sign must meet the following—

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, each passenger emergency exit marking and each locating sign must be manufactured to meet the requirements of § 25.812(b) of this chapter in effect on April 30, 1972. On these airplanes, no sign may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts. The colors may be reversed if it increases the emergency illumination of the passenger compartment. However, the Administrator may authorize deviation from the two-inch background requirements if he finds that special circumstances exist that make compliance impractical. On these airplanes, no sign may continue to be used if its luminescence (brightness) decreases to below 250 microlamberts.

(c) *Lighting for interior emergency exit markings.* Each passenger-carrying airplane must have an emergency lighting system, independent of the main lighting system. However, sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system. The emergency lighting system must—

(1) Illuminate each passenger exit marking and locating sign;

(2) Provide enough general lighting in the passenger cabin so that the average illumination when measured at 40-inch intervals at seat armrest height, on the centerline of the main passenger aisle, is at least 0.05 footcandles; and

(3) For airplanes type certificated after January 1, 1958, after November 26, 1986, include floor proximity emergency escape path marking which meets the requirements of § 25.812(e) of this chapter in effect on November 26, 1984.

(d) *Emergency light operation.* Except for lights forming part of emergency lighting subsystems provided in compliance with § 25.812(h) of this chapter (as prescribed in paragraph (h) of this section) that serve no more than one assist means, are independent of the airplane's main emergency lighting systems, and are automatically activated when the assist means is deployed, each light required by paragraphs (c) and (h) must comply with the following—

(1) Until July 1, 1971, each light must be operable manually, and must operate automatically from the independent lighting system—

(i) In a crash landing; or

(ii) Whenever the airplane's normal electric power to the light is interrupted.

(2) After June 30, 1971, each light must—

(i) Be operable manually both from the flight crew station and from a point in the passenger compartment that is readily accessible to a normal flight attendant seat;

of the fuselage need not be considered.

(3) After May 1, 1974, each light must provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing.

(4) After December 1, 1980, each light must have a cockpit control device that has an "on," "off," and "armed" position.

(e) *Emergency exit operating handles.*

(1) For a passenger-carrying airplane for which the application for the type certificate was filed prior to May 1, 1972, the location of each passenger emergency exit operating handle, and instructions for opening the exit, must be shown by a marking on or near the exit that is readable from a distance of 30 inches. In addition, for each Type I and Type II emergency exit with a locking mechanism released by rotary motion of the handle, the instructions for opening must be shown by—

(i) A red arrow with a shaft at least ¾ inch wide and a head twice the width of the shaft, extending along at least 70 degrees of arc at a radius approximately equal to ¾ of the handle length; and

(ii) The word "open" in red letters one inch high placed horizontally near the head of the arrow.

(2) For a passenger-carrying airplane for which the application for the type certificate was filed on or after May 1, 1972, the location of each passenger emergency exit operating handle and instructions for opening the exit must be shown in accordance with the requirements under which the airplane was type certificated. On these airplanes, no operating handle or operating handle cover may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts.

(f) *Emergency exit access.* Access to emergency exits must be provided as follows for each passenger-carrying airplane—

(1) Each passageway between individual passenger areas, or leading to a Type I or Type requirement for an airplane certificated under the provisions of part 4b of the Civil Air Regulations in effect before December 20, 1951, if he finds that special circumstances exist that provide an equivalent level of safety.

(3) There must be access from the main aisle to each Type III and Type IV exit. The access from the aisle to these exits must not be obstructed by seats, berths, or other protrusions in a manner that would reduce the effectiveness of the exit. In addition—

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the access must meet the requirements of § 25.813(c) of this chapter in effect on April 30, 1972; and

(ii) [For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the access must meet the emergency exit access requirements under which the airplane was certificated; except that—

[(iii) After December 3, 1992, the access for an airplane type certificated after January 1, 1958, must meet the requirements of § 25.813(c) of this chapter, effective June 3, 1992.

[(iv) Contrary provisions of this section notwithstanding, the Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may authorize deviation from the requirements of paragraph (f)(3)(iii) of this section if it is determined that special circumstances make compliance impractical. Such special circumstances include, but are not limited to, the following conditions when they preclude achieving compliance with § 25.813(c)(1)(i) or (ii) without a reduction in the total number of passenger seats: emergency exits located in close proximity to each other; fixed installations such as lavatories, galleys, *etc.*; permanently mounted bulkheads; an insufficient number of seat rows ahead of or behind the exit to enable compliance without a reduction in the seat row pitch of more than one inch; or an insufficient

[(v) The Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may also authorize a compliance date later than December 3, 1992, if it is determined that special circumstances make compliance by that date impractical. A request for such grant of deviation must outline the airplanes for which compliance will be achieved by December 3, 1992, and include a proposed schedule for incremental compliance of the remaining airplanes in the operator's fleet. In addition, the request must include credible reasons why compliance cannot be achieved earlier.]

(4) If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway must not be obstructed. However, curtains may be used if they allow free entry through the passageway.

(5) No door may be installed in any partition between passenger compartments.

(6) If it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door must have a means to latch it in open position, and the door must be latched open during each takeoff and landing. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, listed in § 25.561(b) of this chapter.

(g) *Exterior exit markings.* Each passenger emergency exit and the means of opening that exit from the outside must be marked on the outside of the airplane. There must be a 2-inch colored band outlining each passenger emergency exit on the side of the fuselage. Each outside marking, including the band, must be readily distinguishable from the surrounding fuselage area by contrast in color.

The markings must comply with the following—

(1) If the reflectance of the darker color is 15 percent or less, the reflectance of the lighter color must be at least 45 percent.

the opening means for such an exit is located on only one side of the fuselage, a conspicuous marking to that effect must be provided on the other side. "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives.

(h) *Exterior emergency lighting and escape route.*

(1) Each passenger-carrying airplane must be equipped with exterior lighting that meets the following requirements—

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the requirements of § 25.812(f) and (g) of this chapter in effect on April 30, 1972.

(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the exterior emergency lighting requirements under which the airplane was type certificated.

(2) Each passenger-carrying airplane must be equipped with a slip-resistant escape route that meets the following requirements—

(i) For an airplane for which the application for the type certificate was flied prior to May 1, 1972, the requirements of § 25.803(e) of this chapter in effect on April 30, 1972.

(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the slip-resistant escape route requirements under which the airplane was type certificated.

(i) *Floor level exits.* Each floor level door or exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 or more inches high and 20 or more inches wide, but not wider than 46 inches, each passenger ventral exit (except the ventral exits on M–404 and CV–240 airplanes), and each tail cone exit, must meet the requirements of this section for floor level emergency exits. However, the Administrator may grant a deviation from this paragraph if he finds that circumstances make full compliance impractical and that an acceptable level of safety has been achieved.

(1) Designed and constructed so that it cannot be opened during flight; and

(2) Marked with a placard readable from a distance of 30 inches and installed at a conspicuous location near the means of opening the exit, stating that the exit has been designed and constructed so that it cannot be opened during flight.

(l) *Portable lights.* After December 1, 1980, no person may operate a passenger-carrying airplane unless it is equipped with flashlight stowage provisions accessible from each flight attendant seat.

(m) Except as provided by § 121.627(c) and except for an airplane used in operations under this part on October 16, 1987, and having an emergency exit configuration installed and authorized for operation prior to October 16, 1987, for an airplane that is required to have more than one passenger emergency exit for each side of the fuselage, no passenger emergency exit shall be more than 60 feet from any adjacent passenger emergency exit on the same side of the same deck of the fuselage, as measured parallel to the airplane's longitudinal axis between the nearest exit edges.

(Amdt. 121–2, Eff. 6/7/65); (Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–35, Eff. 10/24/67); (Amdt. 121–38, Eff. 1/31/68); (Amdt. 121–41, Eff. 6/20/68); (Amdt. 121–45, Eff. 2/15/69); (Amdt. 121–46, Eff. 4/23/69); (Amdt. 121–47, Eff. 7/11/69); (Amdt. 121–77, Eff. 9/25/71); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–99, Eff. 12/31/72); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–183, Eff. 11/26/84); (Amdt. 121–205, Eff. 7/24/89); [(Amdt. 121–228, Eff. 6/3/92)]

§ 121.311 Seats, safety belts, and shoulder harnesses.

(a) No person may operate an airplane unless there are available during the takeoff, en route flight, and landing—

(1) An approved seat or berth for each person on board the airplane who has reached his second birthday; and

(2) An approved safety belt for separate use by each person on board the airplane who has or her during movement on the surface, takeoff, and landing. A safety belt provided for the occupant of a seat may not be used by more than one person who has reached his or her second birthday. Notwithstanding the preceding requirements, a child may—

[(1) Be held by an adult who is occupying an approved seat or berth if that child has not reached his or her second birthday; or

[(2) Nothwithstanding any other requirement of this chapter, occupy an approved child restraint system furnished by the certificate holder or one of the persons described in paragraph (b)(2)(i) of this section, provided—

[(i) The child is accompanied by a parent, guardian, or attendant designated by the child's parent or guardian to attend to the safey of the child during the flight;

[(ii) The approved child restraint system bears one or more labels as follows—

[(A) Seats manufactured to U.S. standards between January 1, 1981, and February 25, 1985, must bear the label: "This child restraint system conforms to all applicable Federal motor vehicle safety standards." Vest- and harness-type child restraint systems manufactured before February 26, 1985, bearing such a label are not approved for the purposes of this section;

[(B) Seats manufactured to U.S. standards on or after February 26, 1985, must bear two labels—

[(*1*) "This child restraint system conforms to all applicable Federal motor vehicle safety standards"; and

[(2) "This restraint is certified for use in motor vehicles and aircraft" in red lettering;

[(C) Seats that do not qualify under paragraphs (b)(2)(ii)(A) and (b)(2)(ii)(B) of this section must bear either a label showing approval of a foreign government or a label showing that the seat was manufactured under the standards of the United Nations; and

[(C) The restraint system must bear the appropriate label(s).

[(c) No certificate holder may prohibit a child, if requested by the child's parent, guardian, or designated attendant, from occupying a child restraint system furnished by the child's parent, guardian, or designated attendant, provided the child holds a ticket for an approved seat or berth, or such seat or berth is otherwise made available by the certificate holder for the child's use, and the requirements contained in paragraphs (b)(2)(i) through (b)(2)(iii) of this section are met. This section does not prohibit the certificate holder from providing child restraint systems or, consistent with safe operating practices, determining the most appropriate passenger seat location for the child restraint system.]

[(d) E]ach sideward facing seat must comply with applicable requirements of § 25.785(c) of this chapter.

[(e)] Except as provided in paragraphs (e)(1) and (2) of this section, no certificate holder may take off or land an airplane unless each passenger seat back is in the upright position. Each passenger shall comply with instructions given by a crewmember in compliance with this paragraph.

(1) This paragraph does not apply to seat backs placed in other than the upright position in compliance with [§ 121.310(g)(3).]

(2) This paragraph does not apply to seats on which cargo or persons who are unable to sit erect for a medical reason are carried in accordance with procedures in the certificate holder's manual if the seat back does not obstruct any passenger's access to the aisle or to any emergency exit.

[(f)] No person may operate a transport category airplane that was type certificated after January 1, 1958, unless it is equipped at each flight deck station with a combined safety belt and shoulder harness that meets the applicable requirements specified in § 25.785 of this chapter, effective March 6, 1980, except that—

(1) Shoulder harnesses and combined safety belt and shoulder harnesses that were approved chapter, effective March 6, 1980, except that—

(1) Combined safety belt and shoulder harnesses that were approved and installed before March 6, 1980, may continue to be used; and

(2) Safety belt and shoulder harness restraint systems may be designed to the inertia load factors established under the certification basis of the airplane.

(3) The requirements of § 25.785(h) do not apply to passenger seats occupied by flight attendants not required by § 121.391.

[(h)] Each occupant of a seat equipped with a combined safety belt and shoulder harness must have the combined safety belt and shoulder harness properly secured about that occupant during takeoff and landing and be able to properly perform assigned duties.

[(i)] At each unoccupied seat, the safety belt and shoulder harness, if installed, must be secured so as not to interfere with crewmembers in the performance of their duties or with the rapid egress of occupants in an emergency.

(Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–41, Eff. 6/20/68); (Amdt. 121–75, Eff. 8/30/71); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–133, Eff. 5/16/77); (Amdt. 121–155, Eff. 3/6/80); (Amdt. 121–157, Eff. 5/6/80); (Amdt. 121–170, Eff. 3/6/81); (Amdt. 121–177, Eff. 3/6/82); [(Amdt 121–230, Eff. 10/15/92)]

§ 121.312 Materials for compartment interiors.

(a) Except for those materials covered by paragraph (b) of this section, all materials in each compartment used by the crewmembers or passengers must meet the requirements of § 25.853 of this chapter in effect as follows or later amendment thereto—

(1) All airplanes manufactured on or after August 20, 1988, but prior to August 20, 1990, must comply with the heat release rate testing provisions of § 25.853(a–1) in effect on August 20, 1986, or the date of a later amendment thereto, except that the total heat release over the first 2 minutes of sample exposure must not

20, 1988—

(i) An airplane for which the application for type certificate was filed prior to May 1, 1972, must comply with the provisions of § 25.853 in effect on April 30, 1972;

(ii) An airplane for which the application for type certificate was filed on or after May 1, 1972, must comply with the materials requirements under which the airplane was type certificated.

(4) Upon the first substantially complete replacement of the cabin interior on or after August 20, 1988, airplanes type certificated on or before January 1, 1958, must comply with the provisions of § 25.853 in effect on April 30, 1972.

(5) Upon the first substantially complete replacement of the cabin interior components subject to § 25.853(a–1) on or after August 20, 1988, but prior to August 20, 1990, airplanes type certificated after January 1, 1958, must comply with the heat release testing provisions of that paragraph in effect on August 20, 1986, or the date of a later amendment thereto, except that the total heat release over the first 2 minutes of sample exposure shall not exceed 100 kilowatt-minutes per square meter, and the peak heat release rate shall not exceed 100 kilowatts per square meter.

(6) Upon the first substantially complete replacement of the cabin interior components identified in § 25.853(a–1) on or after August 20, 1990, airplanes type certificated after January 1, 1958, must comply with the heat release rate and smoke testing provisions of that paragraph in effect on September 26, 1988.

(7) Contrary provisions of this section notwithstanding, the Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may authorize deviation from the requirements of paragraph (a)(1), (a)(2), (a)(5), or (a)(6) of this section for specific components of the cabin interior which do not meet applicable flammability and smoke emission requirements, if the determination is made that special circumstances exist that make compliance nents for which timely compliance will not be achieved, credible reasons for such noncompliance.

(b) For airplanes type certificated after January 1, 1958, after November 26, 1987, seat cushions, except those on flight crewmember seats, in any compartment occupied by crew or passengers must comply with the requirements pertaining to fire protection of seat cushions in § 25.853(c), effective November 26, 1984, and appendix F to part 25 of this chapter, effective November 26, 1984.

(Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–184, Eff. 11/26/84); (Amdt. 121–189, Eff. 8/20/86); (Amdt. 121–198, Eff. 9/26/88)

§ 121.313 Miscellaneous equipment.

No person may conduct operation unless the following equipment is installed in the airplane—

(a) If protective fuses are installed on an airplane, the number of spare fuses approved for that airplane and appropriately described in the certificate holder's manual.

(b) A windshield wiper or equivalent for each pilot station.

(c) A power supply and distribution system that meets the requirements of §§ 25.1309, 25.1331, 25.1351(a) and (b)(1) through (4), 25.1353, 25.1355, and 25.1431(b) or that is able to produce and distribute the load for the required instruments and equipment, with use of an external power supply if any one power source or component of the power distribution system fails. The use of common elements in the system may be approved if the Administrator finds that they are designed to be reasonably protected against malfunctioning. Engine-driven sources of energy, when used, must be on separate engines.

(d) A means for indicating the adequacy of the power being supplied to required flight instruments.

(e) Two independent static pressure systems, vented to the outside atmospheric pressure so that they will be least affected by air flow variation or moisture or other foreign matter, and installed so as to be airtight except for the vent. When

(g) A key for each door that separates a passenger compartment from another compartment that has emergency exit provisions. The key must be readily available for each crewmember.

(h) A placard on each door that is the means of access to a required passenger emergency exit, to indicate that it must be open during takeoff and landing.

(i) A means for the crew, in an emergency to unlock each door that leads to a compartment that is normally accessible to passengers and that can be locked by passengers.

(Amdt. 121–5, Eff. 4/30/65)

§ 121.314 Cargo and baggage compartments.

(a) After March 20, 1991, each Class C or D compartment, as defined in § 25.857 of part 25 of this chapter, greater than 200 cubic feet in volume in a transport category airplane type certificated after January 1, 1958, must have ceiling and sidewall liner panels which are constructed of—

(1) Glass fiber reinforced resin;

(2) Materials which meet the test requirements of part 25, appendix F, part III of this chapter; or

(3) In the case of liner installations approved prior to March 20, 1989, aluminum.

(b) For compliance with this section, the term ''liner'' includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain a fire.

Docket No. 25430 (54 FR 7389) Eff. 2/17/89; (Amdt. 121–202, Eff. 3/20/89)

§ 121.315 Cockpit check procedure.

(a) Each certificate holder shall provide an approved cockpit check procedure for each type of aircraft.

(b) The approved procedures must include each item necessary for flight crewmembers to check for safety before starting engines, taking off, or landing, and in engine and systems emergencies. The procedures must be designed so that a flight operated after October 30, 1991, must meet the requirements of § 25.963(e) of this Chapter in effect on October 30, 1989.

Docket No. 25614 (54 FR 40354) Eff. 9/29/89; (Amdt. 121–208, Eff. 10/30/89)

§ 121.317 Passenger information.

(a) No person may operate an airplane unless it is equipped with passenger information signs that meet the requirements of § 25.791 of this chapter. The signs must be constructed so that the crewmembers can turn them on and off.

(b) [The ''Fasten Seat Belt'' sign shall be turned on during any movement on the surface, for each takeoff, for each landing, and at any other time considered necessary by the pilot in command.]

(c) No person may operate an aircraft on a flight segment on which smoking is prohibited unless the ''No Smoking'' passenger information signs are lighted during the entire flight segment, or one or more ''No Smoking'' placards meeting the requirements of § 25.1541 are posted during the entire flight segment. If both the lighted signs and the placards are used, the signs must remain lighted during the entire flight segment.

Smoking is prohibited on scheduled flight segments—

(1) Between any two points within Puerto Rico, the United States Virgin Islands, the District of Columbia, or any State of the United States (other than Alaska or Hawaii) or between any two points in any one of the above-mentioned jurisdictions (other than Alaska or Hawaii);

(2) Within the State of Alaska or within the State of Hawaii; or

(3) Scheduled in the current Worldwide or North American Edition of the *Official Airline Guide* for 6 hours or less in duration and between any point listed in paragraph (c)(1) of this section and any point in Alaska or Hawaii, or between any point in Alaska and any point in Hawaii.[6]

(d) [No person may operate a passenger-carrying airplane under this part unless at least one legible sign or placard that reads ''Fasten Seat Belt While

graph (a) of this section.

(f) [Each passenger required by § 121.311(b) to occupy a seat or berth shall fasten his or her safety belt about him or her and keep it fastened while the "Fasten Seat Belt" sign is lighted.

(g) [No person may smoke while a "No Smoking" sign is lighted or if "No Smoking" placards are posted, except that the pilot in command may authorize smoking on the flight deck except during airplane movement on the surface, takeoff, or landing.]

(h) No person may smoke in any airplane lavatory.

(i) No person may tamper with, disable, or destroy any smoke detector installed in any airplane lavatory.

(j) [On flight segments other than those described in paragraph (c) of this section, the "No Smoking" sign must be turned on during any movement on the surface, for each takeoff, for each landing, and at any other time considered necessary by the pilot in command.

[(k) Each passenger shall comply with instructions given him or her by crewmembers regarding compliance with paragraphs (f), (g), and (h) of this section.]

Docket No. 25590 (53 FR 12361) Eff. 4/13/88; (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–143, Eff. 6/26/78); (Amdt. 121–159, Eff. 8/31/80); (Amdt. 121–196, Eff. 4/23/88); (Amdt. 121–213, Eff. 2/25/90); [(Amdt. 121–230, Eff. 10/15/92)]

§ 121.318 Public address system.

No person may operate an airplane with a seating capacity of more than 19 passengers unless it is equipped with a public address system which—

(a) Is capable of operation independent of the crewmember interphone system required by § 121.319, except for handsets, headsets, microphones, selector switches, and signaling devices;

(b) Is approved in accordance with § 21.305 of this chapter;

(c) Is accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

by a flight attendant at each of those stations in the passenger compartment from which its use is accessible;

(f) Is audible at all passenger seats, lavatories, and flight attendant seats and work stations; and

(g) For transport category airplanes manufactured on or after November 27, 1990, meets the requirements of § 25.1423 of this chapter.

Docket No. 24995 (54 FR 43926) Eff. 10/27/89; (Amdt. 121–105, Eff. 9/8/73); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–159, Eff. 8/31/80); (Amdt. 121–179, Eff. 10/1/82); (Amdt. 121–209, Eff. 11/27/89)

§ 121.319 Crewmember interphone system.

(a) After September 8, 1975, no person may operate an airplane with a seating capacity of more than 19 passengers unless the airplane is equipped with a crewmember interphone system that—

(1) Reserved

(2) Is capable of operation independent of the public address system required by § 121.318(a) except for handsets, headsets, microphones, selector switches, and signaling devices; and

(3) Meets the requirements of paragraph (b) of this section.

(b) The crewmember interphone system required by paragraph (a) of this section must be approved in accordance with § 21.305 of this chapter and meet the following requirements:

(1) After December 1, 1980, it must provide a means of two-way communication between the pilot compartment and—

(i) Each passenger compartment; and

(ii) Each galley located on other than the main passenger deck level.

(2) It must be accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

(3) It must be accessible for use from at least one normal flight attendant station in each passenger compartment;

(4) It must be capable of operation within 10 seconds by a flight attendant at those stations

equipped;

(ii) It must have an alerting system incorporating aural or visual signals for use by flight crewmembers to alert flight attendants and for use by flight attendants to alert flight crewmembers;

(iii) The alerting system required by paragraph (b)(5)(ii) of this section must have a means for the recipient of a call to determine whether it is a normal call or an emergency call; and

(iv) When the airplane is on the ground, it must provide a means of two-way communication between ground personnel and either of at least two flight crewmembers in the pilot compartment. The interphone system station for use by ground personnel must be so located that personnel using the system may avoid visible detection from within the airplane.

Docket No. 10865 (38 FR 21494) Eff. 8/9/73; (Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–105, Eff. 9/8/73); (Amdt. 121–121, Eff. 9/8/75); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–178, Eff. 4/28/82)

§ 121.321 [Reserved]

(Amdt. 121–3, Eff. 4/1/65); (Amdt. 121–155, Eff. 3/6/80)

§ 121.323 Instruments and equipment for operations at night.

No person may operate an airplane at night unless it is equipped with the following instruments and equipment in addition to those required by §§ 121.305 through 121.321—

(a) Position lights.

(b) An anti-collision light, for large airplanes.

(c) Two landing lights.

(d) Instrument lights providing enough light to make each required instrument, switch, or similar instrument, easily readable and installed so that the direct rays are shielded from the flight crewmembers' eyes and that no objectionable reflections are visible to them. There must be a means of

§ 121.325 Instruments and equipment for operations under IFR or over-the-top.

No person may operate an airplane under IFR or over-the-top conditions unless it is equipped with the following instruments and equipment, in addition to those required by §§ 121.305 through 121.321—

(a) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing.

(b) A sensitive altimeter.

(c) Instrument lights providing enough light to make each required instrument, switch, or similar instrument, easily readable and so installed that the direct rays are shielded from the flight crewmembers' eyes and that no objectionable reflections are visible to them, and a means of controlling the intensity of illumination unless it is shown that nondimming instrument lights are satisfactory.

§ 121.327 Supplemental oxygen: reciprocating engine powered airplanes.

(a) *General.* Except where supplemental oxygen is provided in accordance with § 121.331, no person may operate an airplane unless supplemental oxygen is furnished and used as set forth in paragraphs (b) and (c) of this section. The amount of supplemental oxygen required for a particular operation is determined on the basis of flight altitudes and flight duration, consistent with the operation procedures established for each operation and route.

(b) *Crewmembers.*

(1) At cabin pressure altitudes above 10,000 feet up to and including 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crewmembers, for that part of the flight at those altitudes that is of more than 30 minutes duration.

(2) At cabin pressure altitudes above 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crew-

with an amount of supplemental oxygen equal to that provided for crewmembers on duty other than on flight deck duty. If a standby crewmember is not on call and will not be on flight deck duty during the remainder of the flight, he is considered to be a passenger for the purposes of supplemental oxygen requirements.

(c) *Passengers.* Each certificate holder shall provide a supply of oxygen, approved for passenger safety, in accordance with the following—

(1) For flights of more than 30 minutes duration at cabin pressure altitudes above 8,000 feet up to and including 14,000 feet, enough oxygen for 30 minutes for 10 percent of the passengers.

(2) For flights at cabin pressure altitudes above 14,000 feet up to and including 15,000 feet, enough oxygen for that part of the flight at those altitudes for 30 percent of the passengers.

(3) For flights of cabin pressure altitudes above 15,000 feet, enough oxygen for each passenger carried during the entire flight at those altitudes.

(d) For the purposes of this subpart "cabin pressure altitude" means the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" means the altitude above sea level at which the airplane is operated. For airplanes without pressurized cabins, "cabin pressure altitude" and "flight altitude" mean the same thing.

§ 121.329 Supplemental oxygen for sustenance: turbine engine powered airplanes.

(a) *General.* When operating a turbine engine powered airplane, each certificate holder shall equip the airplane with sustaining oxygen and dispensing equipment for use as set forth in this section—

(1) The amount of oxygen provided must be at least the quantity necessary to comply with paragraphs (b) and (c) of this section.

(2) The amount of sustaining and first-aid oxygen required for a particular operation to comply with the rules in this part is determined on the basis of cabin pressure altitudes and flight

ance with the emergency procedures specified in the Airplane Flight Manual, without exceeding its operating limitations, to a flight altitude that will allow successful termination of the flight.

(4) Following the failure, the cabin pressure altitude is considered to be the same as the flight altitude unless it is shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude. Under those circumstances, the maximum cabin pressure altitude attained may be used as a basis for certification or determination of oxygen supply, or both.

(b) *Crewmembers.* Each certificate holder shall provide a supply of oxygen for crewmembers in accordance with the following—

(1) At cabin pressure altitudes above 10,000 feet, up to and including 12,000 feet, oxygen must be provided for and used by each member of the flight crew on flight deck duty and must be provided for other crewmembers for that part of the flight at those altitudes that is more than 30 minutes duration.

(2) At cabin pressure altitudes above 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crewmembers during the entire flight at those altitudes.

(3) When a flight crewmember is required to use oxygen, he must use it continuously except when necessary to remove the oxygen mask or other dispenser in connection with his regular duties. Standby crewmembers who are on call or are definitely going to have flight deck duty before completing the flight must be provided with an amount of supplemental oxygen equal to that provided for crewmembers on duty other than on flight duty. If a standby crewmember is not on call and will not be on flight deck duty during the remainder of the flight he is considered to be a passenger for the purposes of supplemental oxygen requirements.

(c) *Passengers.* Each certificate holder shall provide a supply of oxygen for passengers in accordance with the following—

(3) For flights at cabin pressure altitudes above 15,000 feet, enough oxygen for each passenger carried during the entire flight at those altitudes.

§ 121.331 Supplemental oxygen requirements for pressurized cabin airplanes: reciprocating engine powered airplanes.

(a) When operating a reciprocating engine powered airplane with a pressurized cabin, each certificate holder shall equip the airplane to comply with paragraphs (b) through (d) of this section in the event of cabin pressurization failure.

(b) *For crewmembers.* When operating at flight altitudes above 10,000 feet, the certificate holder shall provide enough oxygen for each crewmember for the entire flight at those altitudes and not less than a two-hour supply for each flight crewmember on flight deck duty. The required two hours supply is that quantity of oxygen necessary for a constant rate of descent from the airplane's maximum certificated operating altitude to 10,000 feet in ten minutes and followed by 110 minutes at 10,000 feet. The oxygen required by § 121.337 may be considered in determining the supplemental breathing supply required for flight crewmembers on flight deck duty in the event of cabin pressurization failure.

(c) *For passengers.* When operating at flight altitudes above 8,000 feet, the certificate holder shall provide oxygen as follows—

(1) When an airplane is not flown at a flight altitude above flight level 250, enough oxygen for 30 minutes for 10 percent of the passengers, if at any point along the route to be flown the airplane can safely descend to a flight altitude of 14,000 feet or less within four minutes.

(2) If the airplane cannot descend to a flight altitude of 14,000 feet or less within four minutes, the following supply of oxygen must be provided—

(i) For that part of the flight that is more than four minutes duration at flight altitudes above 15,000 feet, the supply required by § 121.327(c)(3).

tude above flight level 250, enough oxygen for 30 minutes for 10 percent of the passengers for the entire flight (including emergency descent) above 8,000 feet, up to and including 14,000 feet, and to comply with § 121.327(c)(2) and (3) for flight above 14,000 feet.

(d) For the purposes of this section it is assumed that the cabin pressurization failure occurs at a time during flight that is critical from the standpoint of oxygen need and that after the failure the airplane will descend, without exceeding its normal operating limitations, to flight altitudes allowing safe flight with respect to terrain clearance.

(Amdt. 121–132, Eff. 2/1/77)

§ 121.333 Supplemental oxygen for emergency descent and for first aid: turbine engine powered airplanes with pressurized cabins.

(a) *General.* When operating a turbine engine powered airplane with a pressurized cabin, the certificate holder shall furnish oxygen and dispensing equipment to comply with paragraphs (b) through (e) of this section in the event of cabin pressurization failure.

(b) *Crewmembers.* When operating at flight altitudes above 10,000 feet, the certificate holder shall supply enough oxygen to comply with § 121.329, but not less than a two-hour supply for each flight crewmember on flight deck duty. The required two hours supply is that quantity of oxygen necessary for a constant rate of descent from the airplane's maximum certificated operating altitude to 10,000 feet in ten minutes and followed by 110 minutes at 10,000 feet. The oxygen required in the event of cabin pressurization failure by § 121.337 may be included in determining the supply required for flight crewmembers on flight deck.

(c) *Use of oxygen masks by flight crewmembers.*

(1) When operating at flight altitudes above flight level 250, each flight crewmember on flight deck duty must be provided with an oxygen mask so designed that it can be rapidly placed on his face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and

tion.

(2) When operating at flight altitudes above flight level 250, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask secured, sealed, and supplying oxygen, except that the one pilot need not wear and use an oxygen mask while at or below flight level 410 if each flight crewmember on flight deck duty has a quick-donning type of oxygen mask that the certificate holder has shown can be placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within five seconds. The certificate holder shall also show that the mask can be put on without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties. The oxygen mask after being put on must not prevent immediate communication between the flight crewmember and other crewmembers over the airplane intercommunication system.

(3) Notwithstanding paragraph (c)(2) of this section, if for any reason at any time it is necessary for one pilot to leave his station at the controls of the airplane when operating at flight altitudes above flight level 250, the remaining pilot at the controls shall put on and use his oxygen mask until the other pilot has returned to his duty station.

(4) Before the takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to ensure that the oxygen mask is functioning, fitted properly, and connected to appropriate supply terminals, and that the oxygen supply and pressure are adequate for use.

(d) *Use of portable oxygen equipment by cabin attendants.* Each attendant shall, during flight above flight level 250 flight altitude, carry portable oxygen equipment with at least a 15-minute supply of oxygen unless it is shown that enough portable oxygen units with masks or spare outlets and masks are distributed throughout the cabin to ensure immediate availability of oxygen to each cabin attendant, regardless of his location at the time of cabin depressurization.

available at the rate prescribed by this part for a 30-minute period for at least 10 percent of the passenger cabin occupants.

(2) When an airplane is operated at flight altitudes up to and including flight level 250 and cannot descend safely to a flight altitude of 14,000 feet within four minutes, or when an airplane is operated at flight altitudes above flight level 250, oxygen must be available at the rate prescribed by this part for not less than 10 percent of the passenger cabin occupants for the entire flight after cabin depressurization, at cabin pressure altitudes above 10,000 feet up to and including 14,000 feet and, as applicable, to allow compliance with § 121.329(c)(2) and (3), except that there must be not less than a 10-minute supply for the passenger cabin occupants.

(3) For first aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above flight level 250, a supply of oxygen in accordance with the requirements of § 25.1443(d) must be provided for two percent of the occupants for the entire flight after cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than two, must be provided, with a means for the cabin attendants to use this supply.

(f) *Passenger briefing.* Before flight is conducted above flight level 250, a crewmember shall instruct the passengers on the necessity of using oxygen in the event of cabin depressurization and shall point out to them the location and demonstrate the use of the oxygen-dispensing equipment.

(Amdt. 121–11, Eff. 9/30/65); (Amdt. 121–132, Eff. 2/1/77)

§ 121.335 Equipment standards.

(a) *Reciprocating engine powered airplanes.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with § 121.327 must meet the standards established in § 4b.651 of the Civil Air Regulations as in effect

with §§ 121.329 and 121.333 must meet the standards established in § 4b.651 of the Civil Air Regulations as in effect on September 1, 1958, except that if the certificate holder shows full compliance with those standards to be impracticable, the Administrator may authorize any changes in those standards that he finds will provide an equivalent level of safety.

§ 121.337 Protective breathing equipment.

(a) The certificate holder shall furnish approved protective breathing equipment (PBE) meeting the equipment, breathing gas, and communication requirements contained in paragraph (b) of this section.

(b) *Pressurized and nonpressurized cabin airplanes.* Except as provided in paragraph (f) of this section, no person may operate a transport category airplane unless protective breathing equipment meeting the requirements of this section is provided as follows—

(1) *General.* The equipment must protect the flightcrew from the effects of smoke, carbon dioxide or other harmful gases or an oxygen deficient environment caused by other than an airplane depressurization while on flight deck duty and must protect crewmembers from the above effects while combatting fires on board the airplane.

(2) The equipment must be inspected regularly in accordance with inspection guidelines and the inspection periods established by the equipment manufacturer to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes. The inspection periods may be changed upon a showing by the certificate holder that the changes would provide an equivalent level of safety.

(3) That part of the equipment protecting the eyes must not impair the wearer's vision to the extent that a crewmember's duties cannot be accomplished and must allow corrective glasses to be worn without impairment of vision or loss of the protection required by paragraph (b)(1) of this section.

one normal flight attendant station in each passenger compartment.

(5) The equipment, while in use, must allow any crewmember to use the airplane interphone system at any of the flight attendant stations referred to in paragraph (b)(4) of this section.

(6) The equipment may also be used to meet the supplemental oxygen requirements of this part provided it meets the oxygen equipment standards of § 121.335 of this part.

(7) Protective breathing gas duration and supply system equipment requirements are as follows—

(i) The equipment must supply breathing gas for 15 minutes at a pressure altitude of 8,000 feet for the following:

(A) Flight crewmembers while performing flight deck duties;

(B) Crewmembers while combatting an in-flight fire.

(ii) The breathing gas system must be free from hazards in itself, in its method of operation, and in its effect upon other components.

(iii) For breathing gas systems other than chemical oxygen generators, there must be a means to allow the crew to readily determine, during flight, the quantity of breathing gas available in each source of supply.

(iv) For each chemical oxygen generator, the supply system equipment must meet the requirements of § 25.1450(b) and (c) of this chapter.

(8) Protective breathing equipment with a fixed or portable breathing gas supply meeting the requirements of this section must be conveniently located on the flight deck and be easily accessible for immediate use by each required flight crewmember at his or her assigned duty station.

(9) Protective breathing equipment with a portable breathing gas supply meeting the requirements of this section must be easily accessible and conveniently located for immediate use by crewmembers in combatting fires as follows—

(i) One for use in each Class A, B, and E cargo compartment (as defined in § 25.857

make compliance impractical and the proposed deviation would provide an equivalent level of safety.

(iv) In each passenger compartment, one located within 3 feet of each hand fire extinguisher required by § 121.309 of this part, except that the Administrator may authorize a deviation allowing locations of PBE more than 3 feet from required hand fire extinguisher locations if special circumstances exist that make compliance impractical and the proposed deviation provides an equivalent level of safety.

(c) *Equipment preflight.*

(1) Before each flight, each item of PBE at flight crewmember duty stations must be checked by the flight crewmember who will use the equipment to ensure that the equipment—

(i) For other than chemical oxygen generator systems, is functioning, is serviceable, fits properly (unless a universal-fit type), and is connected to supply terminals and that the breathing gas supply and pressure are adequate for use; and

(ii) For chemical oxygen generator systems, is serviceable and fits properly (unless a universal-fit type).

(2) Each item of PBE located at other than a flight crewmember duty station must be checked by a designated crewmember to ensure that each is properly stowed and serviceable, and, for other than chemical oxygen generator systems, the breathing gas supply is fully charged. Each certificate holder, in its operations manual, must designate at least one crewmember to perform those checks before he or she takes off in that airplane for his or her first flight of the day.

(d) *Compliance dates.*

(1) Notwithstanding the provisions of paragraphs (a) and (b) of this section, the final compliance date for furnishing PBE for use in combatting in-flight fires aboard pressurized and nonpressurized airplanes is January 31, 1990, except that for all-cargo airplanes subject to the supply for PBE, the compliance date is February 18, 1992.

Docket No. 24792 (52 FR 20957) Eff. 6/3/87; (Amdt. 121–193, Eff. 7/6/87); (Amdt. 121–204, Eff. 5/22/89); (Amdt. 121–212, Eff. 2/15/90); (Amdt. 121–218, Eff. 7/30/90); [(Amdt. 121–230, Eff. 10/15/92)]

§ 121.339 Emergency equipment for extended over-water operations.

(a) Except where the Administrator, by amending the operations specifications of the certificate holder, requires the carriage of all or any specific items of the equipment listed below for any over-water operation, or upon application of the certificate holder, the Administrator allows deviation for a particular extended over-water operation, no person may operate an airplane in extended over-water operations without having on the airplane the following equipment—

(1) A life preserver equipped with an approved survivor locator light, for each occupant of the(airplane.

(2) Enough liferafts (each equipped with an approved survivor locator light) of a rated capacity and buoyancy to accommodate the occupants of the airplane. Unless excess rafts of enough capacity are provided, the buoyancy and seating capacity of the rafts must accommodate all occupants of the airplane in the event of a loss of one raft of the largest rated capacity.

(3) At least one pyrotechnic signaling device for each life raft.

(4) [An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or, when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter maunfacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life

marked, approved locations.

(c) A survival kit, appropriately equipped for the route to be flown, must be attached to each required liferaft.

(Amdt. 121–25, Eff. 2/28/67); (Amdt. 121–53, Eff. 10/30/69); (Amdt. 121–79, Eff. 10/21/71); (Amdt. 121–93, Eff. 7/19/72); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–158, Eff. 9/9/80); [(Amdt. 121–239, Eff. 6/21/94)]

§ 121.340 Emergency flotation means.

(a) Except as provided in paragraph (b) of this section, after September 1, 1967, no person may operate a large airplane in any over-water operation unless it is equipped with life preservers in accordance with § 121.339(a)(1), or with an approved flotation means for each occupant. This means must be within easy reach of each seated occupant and must be readily removable from the airplane.

(b) Upon application by the air carrier or commercial operator, the Administrator may approve the operation of an airplane over water without the life preservers or flotation means required by paragraph (a) of this section, if the air carrier or commercial operator shows that the water over which the airplane is to be operated is not such size and depth that life preservers or flotation means would be required for the survival of its occupants in the event the flight terminates in that water.

Docket No. 6713 (31 FR 1147) Eff. 1/28/66; (Amdt. 121–17, Eff. 2/27/66)

§ 121.341 Equipment for operations in icing conditions.

(a) Unless an airplane is certificated under the transport category airworthiness requirements relating to ice protection, no person may operate an airplane in icing conditions unless it is equipped with means for the prevention or removal of ice on windshields, wings, empennage, propellers, and other parts of the airplane where ice formation will adversely affect the safety of the airplane.

§ 121.342 Pitot heat indication systems.

(a) Except as provided in paragraph (b) of this section, after April 12, 1981, no person may operate a transport category airplane equipped with a flight instrument pitot heating system unless the airplane is also equipped with an operable pitot heat indication system that complies with § 25.1326 of this chapter in effect on April 12, 1978.

(b) A certificate holder may obtain an extension of the April 12, 1981, compliance data specified in paragraph (a) of this section, but not beyond April 12, 1983, from the Director, Flight Standards Service if the certificate holder—

(1) Shows that due the circumstances beyond its control it cannot comply by the specified compliance date; and

(2) Submits by the specified compliance data a schedule for compliance, acceptable to the Director, indicating that compliance will be achieved at the earliest practicable date.

(Amdt. 121–175, Eff. 9/30/81); (Amdt. 121–207, Eff. 10/25/89)

§ 121.343 Flight recorders.

(a) Except as provided in paragraphs (b), (c), (d), (e) and (f) of this section, no person may operate a large airplane that is certificated for operations above 25,000 feet altitude or is turbine-engine powered unless it is equipped with one or more approved flight recorders that record data from which the following may be determined within the ranges, accuracies, and recording intervals specified in appendix B of this part—

(1) Time;

(2) Altitude;

(3) Airspeed;

(4) Vertical acceleration;

(5) Heading; and

(6) Time of each radio transmission either to or from air traffic control.

(b) No person may operate a large airplane type certificated up to and including September 30, 1969, for operations above 25,000 feet altitude, or a turbine-engine powered airplane certificated before the

make compliance impractical and the proposed deviation would provide an equivalent level of safety.

(iv) In each passenger compartment, one located within 3 feet of each hand fire extinguisher required by § 121.309 of this part, except that the Administrator may authorize a deviation allowing locations of PBE more than 3 feet from required hand fire extinguisher locations if special circumstances exist that make compliance impractical and the proposed deviation provides an equivalent level of safety.

(c) *Equipment preflight.*

(1) Before each flight, each item of PBE at flight crewmember duty stations must be checked by the flight crewmember who will use the equipment to ensure that the equipment—

(i) For other than chemical oxygen generator systems, is functioning, is serviceable, fits properly (unless a universal-fit type), and is connected to supply terminals and that the breathing gas supply and pressure are adequate for use; and

(ii) For chemical oxygen generator systems, is serviceable and fits properly (unless a universal-fit type).

(2) Each item of PBE located at other than a flight crewmember duty station must be checked by a designated crewmember to ensure that each is properly stowed and serviceable, and, for other than chemical oxygen generator systems, the breathing gas supply is fully charged. Each certificate holder, in its operations manual, must designate at least one crewmember to perform those checks before he or she takes off in that airplane for his or her first flight of the day.

(d) *Compliance dates.*

(1) Notwithstanding the provisions of paragraphs (a) and (b) of this section, the final compliance date for furnishing PBE for use in combatting in-flight fires aboard pressurized and nonpressurized airplanes is January 31, 1990, except that for all-cargo airplanes subject to the supply for PBE, the compliance date is February 18, 1992.

Docket No. 24792 (52 FR 20957) Eff. 6/3/87; (Amdt. 121–193, Eff. 7/6/87); (Amdt. 121–204, Eff. 5/22/89); (Amdt. 121–212, Eff. 2/15/90); (Amdt. 121–218, Eff. 7/30/90); [(Amdt. 121–230, Eff. 10/15/92)]

§ 121.339 Emergency equipment for extended over-water operations.

(a) Except where the Administrator, by amending the operations specifications of the certificate holder, requires the carriage of all or any specific items of the equipment listed below for any over-water operation, or upon application of the certificate holder, the Administrator allows deviation for a particular extended over-water operation, no person may operate an airplane in extended over-water operations without having on the airplane the following equipment—

(1) A life preserver equipped with an approved survivor locator light, for each occupant of the(airplane.

(2) Enough liferafts (each equipped with an approved survivor locator light) of a rated capacity and buoyancy to accommodate the occupants of the airplane. Unless excess rafts of enough capacity are provided, the buoyancy and seating capacity of the rafts must accommodate all occupants of the airplane in the event of a loss of one raft of the largest rated capacity.

(3) At least one pyrotechnic signaling device for each life raft.

(4) [An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or, when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter maunfacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life

may be erased for the purpose of testing the flight recorder or the flight recorder system. Any erasure made in accordance with this paragraph must be of the oldest recorded data accumulated at the time of testing. Except as provided in paragraph (g) of this section, no record need be kept more than 60 days.

(i) In the event of an accident or occurrence that requires immediate notification of the National Transportation Safety Board under part 830 of its regulations and that results in termination of the flight, the certificate holder shall remove the recording media from the airplane and keep the recorded data required by paragraph (a), (b), (c), or (d) of this section, as appropriate, for at least 60 days or for a longer period upon the request of the Board or the Administrator.

(j) Each flight recorder required by this section must be installed in accordance with the requirements of § 25.1459 of this chapter in effect on August 31, 1977. The correlation required by § 25.1459(c) of this chapter need be established only on one airplane of any group of airplanes—

(1) That are of the same type;

(2) On which the model flight recorder and its installation are the same; and

(3) On which there is no difference in the type design with respect to the installation of those first pilot's instruments associated with the flight recorder. The most recent instrument calibration, including the recording medium from which this calibration is derived, and the recorder correlation must be retained by the certificate holder.

(k) Each flight recorder required by this section that records the data specified in paragraph (a), (b), (c), or (d) of this section, as appropriate, must have an approved device to assist in locating that recorder under water.

[(l) No person may operate an airplane specified in paragraph (b) of this section that meets the Stage 2 noise levels of part 36 of this chapter and is subject to § 91.801(c) of this chapter unless it is equipped with one or more approved flight data recorders that utilize a digital method of recording

time an aircraft is scheduled to be out of service for 4 or more days.

[(2) By June 23, 1994, each carrier must submit to the FAA Flight Standards Service, Air Transportation Division (AFS–200), documentation listing those airplanes covered under this paragraph and evidence that it has ordered a sufficient number of flight data recorders to meet the May 26, 1995, compliance date for all aircraft on that list.

[(3) After May 26, 1994, any aircraft that is modified to meet Stage 3 noise levels must have the flight data recorder described in paragraph (c) of this section installed before operating under this part.]

Docket No. 24418 (52 FR 9636) Eff. 3/25/87; (Amdt. 121–15, Eff. 2/5/66); (Amdt. 121–29, Eff. 6/22/67); (Amdt. 121–37, Eff. 12/14/67); (Amdt. 121–66, Eff. 9/18/70); (Amdt. 121–82, Eff. 1/10/72); (Amdt. 121–130, Eff. 11/26/76); (Amdt. 121–135, Eff. 9/1/77); (Amdt. 121–143, Eff. 6/26/78); (Amdt. 121–191, Eff. 5/26/87); (Amdt. 121–197, Eff. 10/11/88); [(Amdt. 121–238, Eff. 5/24/94)]

§ 121.345 Radio equipment.

(a) No person may operate an airplane unless it is equipped with radio equipment required for the kind of operation being conducted.

(b) Where two independent (separate and complete) radio systems are required by §§ 121.347 and 121.349, each system must have an independent antenna installation except that, where rigidly supported nonwire antennas or other antenna installations of equivalent reliability are used, only one antenna is required.

(c) ATC transponder equipment installed within the time periods indicated below must meet the performance and environmental requirements of the following TSOs—

(1) *Through January 1, 1992.*

(i) Any class of TSO–C74b or any class of TSO–C74c as appropriate, provided that the equipment was manufactured before January 1, 1990; or

tion.

(2) When operating at flight altitudes above flight level 250, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask secured, sealed, and supplying oxygen, except that the one pilot need not wear and use an oxygen mask while at or below flight level 410 if each flight crewmember on flight deck duty has a quick-donning type of oxygen mask that the certificate holder has shown can be placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within five seconds. The certificate holder shall also show that the mask can be put on without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties. The oxygen mask after being put on must not prevent immediate communication between the flight crewmember and other crewmembers over the airplane intercommunication system.

(3) Notwithstanding paragraph (c)(2) of this section, if for any reason at any time it is necessary for one pilot to leave his station at the controls of the airplane when operating at flight altitudes above flight level 250, the remaining pilot at the controls shall put on and use his oxygen mask until the other pilot has returned to his duty station.

(4) Before the takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to ensure that the oxygen mask is functioning, fitted properly, and connected to appropriate supply terminals, and that the oxygen supply and pressure are adequate for use.

(d) *Use of portable oxygen equipment by cabin attendants.* Each attendant shall, during flight above flight level 250 flight altitude, carry portable oxygen equipment with at least a 15-minute supply of oxygen unless it is shown that enough portable oxygen units with masks or spare outlets and masks are distributed throughout the cabin to ensure immediate availability of oxygen to each cabin attendant, regardless of his location at the time of cabin depressurization.

available at the rate prescribed by this part for a 30-minute period for at least 10 percent of the passenger cabin occupants.

(2) When an airplane is operated at flight altitudes up to and including flight level 250 and cannot descend safely to a flight altitude of 14,000 feet within four minutes, or when an airplane is operated at flight altitudes above flight level 250, oxygen must be available at the rate prescribed by this part for not less than 10 percent of the passenger cabin occupants for the entire flight after cabin depressurization, at cabin pressure altitudes above 10,000 feet up to and including 14,000 feet and, as applicable, to allow compliance with § 121.329(c)(2) and (3), except that there must be not less than a 10-minute supply for the passenger cabin occupants.

(3) For first aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above flight level 250, a supply of oxygen in accordance with the requirements of § 25.1443(d) must be provided for two percent of the occupants for the entire flight after cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than two, must be provided, with a means for the cabin attendants to use this supply.

(f) *Passenger briefing.* Before flight is conducted above flight level 250, a crewmember shall instruct the passengers on the necessity of using oxygen in the event of cabin depressurization and shall point out to them the location and demonstrate the use of the oxygen-dispensing equipment.

(Amdt. 121–11, Eff. 9/30/65); (Amdt. 121–132, Eff. 2/1/77)

§ 121.335 Equipment standards.

(a) *Reciprocating engine powered airplanes.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with § 121.327 must meet the standards established in § 4b.651 of the Civil Air Regulations as in effect

carriers and commercial operators.

Unless it has the following equipment, no flag or supplemental air carrier or commercial operator may conduct an operation over an uninhabited area or any other area that (in its operations specifications) the Administrator specifies requires equipment for search and rescue in case of an emergency:

(a) Suitable pyrotechnic signaling devices.

(b) [An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or, when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter maunfacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.]

(c) Enough survival kits, appropriately equipped for the route to be flown, for the number of occupants of the airplane.

(Amdt. 121–79, Eff. 10/21/71); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–158, Eff. 9/9/80); [(Amdt. 121–239, Eff. 6/21/94)]

§ 121.355 Equipment for operations on which specialized means of navigation are used.

(a) No certificate holder may conduct an operation—

(1) Using Doppler Radar or an Inertial Navigation System outside the 48 contiguous States and the District of Columbia, unless such systems have been approved in accordance with appendix G to this part; or

the training programs, maintenance programs, relevant operations manual material, and minimum equipment lists prepared in accordance therewith, approved before April 29, 1972, are not required to be approved in accordance with that paragraph. (Amdt. 121–89, Eff. 4/29/72)

§ 121.356 Traffic Alert and Collision Avoidance System.

(a) Unless otherwise authorized by the Administrator, each certificate holder operating a large airplane that has a passenger seating configuration, excluding any pilot seat, of more than 30 seats, shall equip its airplanes with an approved TCAS II traffic alert and collision avoidance system and the appropriate class of Mode S transponder according to the following schedule—

Date	*Required Equipage*
December 30, 1990	At least 20% of all covered airplanes, if the certificate holder operates more than 30 such airplanes.
December 30, 1991	50% of all covered airplane.
December 30, 1993	100% of all covered airplanes.

(b) [Unless otherwise authorized by the Administrator, after December 31, 1995, no person may operate a passenger or combination cargo/passenger (combi) airplane that has a passenger seat configuration, excluding any pilot seat, of 10 to 30 seats unless it is equipped with an approved traffic alert and collision avoidance system. If a TCAS II system is installed, it must be capable of coordinating with TCAS units that meet TSO C–119.]

(c) The appropriate manuals required by § 121.131 of this part shall contain the following information on the TCAS II System required by this section—

(1) Appropriate procedures for—

(i) The operation of the equipment; and

(ii) Proper flightcrew action with respect to the equipment.

cated under the transport category rules (except C–46 type airplanes), unless approved airborne weather radar equipment has been installed in the airplane.

(b) Reserved

(c) Each person operating a transport category airplane required to have approved airborne weather radar equipment installed shall, when using it under this part, operate it in accordance with the following—

(1) *Dispatch.* No person may dispatch an airplane (or begin the flight of an airplane in the case of an air carrier or commercial operator that does not use a dispatch system) under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions that can be detected with airborne weather radar, may reasonably be expected along the route to be flown, unless the airborne weather radar equipment is in satisfactory operating condition.

(2) If the airborne weather radar becomes inoperative en route, the airplane must be operated in accordance with the approved instructions and procedures specified in the operations manual for such an event.

(d) This section does not apply to airplanes used solely within the State of Hawaii or within the State of Alaska and that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Notwithstanding any other provision To obtain approval of a retrofit schedule and of this chapter, an alternate electrical power supply is not required for airborne weather radar equipment.

(Amdt. 121–18, Eff. 4/15/66); (Amdt. 121–130, Eff. 11/26/76)

§ 121.358 Low-altitude windshear system equipment requirements.

(a) *Airplanes manufactured after January 2, 1991.* No person may operate a turbine-powered airplane manufactured after January 2, 1991, unless

(1) The makes/models/ series listed below must be equipped with either an approved airborne windshear warning and flight guidance system, an approved airborne detection and avoidance sym, or an approved combination of these systems—

(i) A–300–600;

(ii) A–310–all series;

(iii) A–320–all series;

(iv) B–737–300, 400, and 500 series;

(v) 13–747–400;

(vi) 13–757–all series;

(vii) 13–767–all series;

(viii) F–100–all series;

(ix) MD–11–all series; and

(x) MD–80 series equipped with an EFIS and Honeywell–970 digital flight guidance computer.

(2) All other turbine-powered airplanes not listed above must be equipped with as a minimum requirement, an approved airborne windshear warning system. These airplanes may be equipped with an approved airborne windshear detection and avoidance system, or an approved combination of these systems.

(c) *Extension of the compliance date.* A certificate holder may obtain an extension of the compliance date in paragraph (b) of this section if it obtains FAA approval of a retrofit schedule. To obtain approval of a retrofit schedule and show continued compliance with that schedule, a certificate holder must do the following—

(1) Submit a request for approval of a retrofit schedule by June 1, 1990, to the Flight Standards Division Manager in the region of the certificate holding district office.

(2) Show that all of the certificate holder's airplanes required to be equipped in accordance with this section will be equipped by the final compliance date established for TCAS II retrofit.

(3) Comply with its retrofit schedule and submit status reports containing information acceptable to the Administrator. The initial report must be submitted by January 2, 1991, and subsequent

specifically excludes turbopropeller power airplanes.

(2) An airplane is considered manufactured on the date the inspection acceptance records reflect that the airplane is complete and meets the FAA Approved Type Design data.

(Amdt. 121–199, Eff. 1/2/89); (Amdt. 121–216, Eff. 4/9/90)

§ 121.359 Cockpit voice recorders.

(a) No certificate holder may operate a large turbine engine powered airplane or a large pressurized airplane with four reciprocating engines unless an approved cockpit voice recorder is installed in that airplane and is operated continuously from the start of the use of the checklist (before starting engines for the purpose of flight), to completion of the final checklist at the termination of the flight.

(b) Each certificate holder shall establish a schedule for completion before the prescribed dates, of the cockpit voice recorder installations required by paragraph (a) of this section. In addition the certificate holder shall identify any airplane specified in paragraph (a) of this section he intends to discontinue using before the prescribed dates.

(c) The cockpit voice recorder required by this section must meet the following application standards—

(1) The requirements of part 25 of this chapter in effect on August 31, 1977.

(2) After September 1, 1980, each recorder container must—

(i) Be either bright orange or bright yellow;

(ii) Have reflective tape affixed to the external surface to facilitate its location under water; and

(iii) Have an approved underwater locating device on or adjacent to the container which is secured in such a manner that they are not likely to be separated during crash impact, unless the cockpit voice recorder, and the flight recorder required by § 121.343, are installed adjacent to each other in such a manner that they are not likely to be smparated during crash impact.

required to use the boom microphone below 18,000 feet mean sea level. No person may operate a large turbine engine powered airplane or a large pressurized airplane with four reciprocating engines manufactured after October 11, 1991, or on which a cockpit voice recorder has been installed after October 11, 1991, unless it is equipped to record the uninterrupted audio signal received by a boom or mask microphone in accordance with § 25.1457(c)(5) of this chapter.

(f) In the event of an accident or occurrence requiring immediate notification of the National Transportation Safety Board under part 830 of its regulations, which results in the termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record is used to assist in determining the cause of accidents or occurrences in connection with investigations under part 830. The Administrator does not use the record in any civil penalty or certificate action.

(Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–23, Eff. 12/1/66); (Amdt. 121–32, Eff. 10/6/67); (Amdt. 121–130, Eff. 11/26/76); (Amdt. 121–135, Eff. 9/1/77); (Amdt. 121–143, Eff. 6/26/78); (Amdt. 121–197, Eff. 10/11/88)

§ 121.360 Ground proximity warning-glide slope deviation alerting system.

(a) Except as provided in paragraphs (b) and (h) of this section, after December 1, 1975, no person may operate a large turbine-powered airplane unless it is equipped with a ground proximity warning system that meets the performance and environment standards of TSO–C92 or incorporates TSO–approved ground proximity warning equipment.

(b) Ground proximity warning systems approved for use under this part and installed before June 5, 1975, may be used in lieu of equipment that meets the performance and environmental standards of TSO-G92 or is TSO-approved until January 1, 1977, except that the requirements of paragraph (c) of this section must be met.

(iv) Inhibition of Mode 4 warnings based on flaps being in other than the landing configuration if the system incorporates a Mode 4 flap warning inhibition control; and

(2) An outline of all input sources that must be operating.

(d) After September 1, 1976 (unless required earlier in the certificate holder's operations specifications), no person may deactivate a ground proximity warning system required by this section except in accordance with the procedures contained in the Airplane Flight Manual.

(e) Whenever a ground proximity warning system required by this section is deactivated, an entry shall be made in the airplane maintenance record that includes the date and time of deactivation.

(f) Except as provided in paragraph (g) of this section, after June 1, 1976, no person may operate a large turbine-powered airplane unless it is equipped with a ground proximity warning-glide slope deviation alerting system that meets the performance and environmental standards contained

(h) A certificate holder may obtain an extension of the December 1, 1975, compliance date specified in paragraph (a) of this section but not beyond June 1, 1976, from the Director, Flight Standards Service if, before December 1, 1975—

(1) It shows that due to circumstances beyond its control it cannot comply by that date; and

(2) It has submitted by that date a schedule for compliance, acceptable to the Director, indicating that the system will be installed at the earliest practicable date.

(i) No person may operate a turbojet powered airplane equipped with a system required by paragraph (f) of this section, that incorporates equipment that meets the performance and environmental standards of TSO–C92b or is approved under the TSO, using other than Warning Envelopes 1 or 3 for Warning Modes 1 and 4.

(Amdt. 121–114, Eff. 1/23/75); (Amdt. 121–119, Eff. 6/5/75); (Amdt. 121–122, Eff. 10/13/75); (Amdt. 121–125, Eff. 11/1/75); (Amdt. 121–126, Eff. 11/24/75); (Amdt. 121–129, Eff. 8/19/76)

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